

CLAIMS

What is claimed is:

- 1 1. A system for mining data comprising:
 - 2 a data store including data having a number of items;
 - 3 a mining application to mine data in the data store, the mining application
 - 4 including logic, the logic, when executed, is to:
 - 5 identify a number of frequent items of the data store;
 - 6 compute a probe structure based on the number of identified frequent
 - 7 items; and,
 - 8 partition the data according to content of the probe structure;
 - 9 wherein the mining application uses the probe structure to build a frequent
 - 10 pattern tree (FP-tree); and
 - 11 a memory for storing the probe structure and the FP-tree.
- 1 2. The system of claim 1, wherein the data of the data store includes a number of
- 2 transactions, wherein each transaction comprises a unique sequence of items
- 3 identified by the logic when identifying the frequent items of the data store.
- 1 3. The system of claim 2, wherein the logic is to partition the transactions
- 2 according to content of the identified frequent items to obtain the probe structure,
- 3 wherein the probe structure includes combinations of the identified frequent items and
- 4 the number of occurrences of one or more content-based transactions.
- 1 4. The system of claim 3, wherein the logic orders the identified frequent items
- 2 based on an occurrence frequency of each identified item in the data store.
- 1 5. The system of claim 3, further comprising a heuristic algorithm, wherein the
- 2 heuristic algorithm is to group the one or more content-based transactions into
- 3 approximately equal groups.

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1 6. The system of claim 1, further comprising a master processor and one or more
2 slave processors, wherein the master processor is to distribute a group of transactions
3 to the one or more slave processors to build the FP-tree.

1 7. The system of claim 6, wherein the one or more slave processors build a part
2 of the FP-tree based on the grouping of content-based transactions.

1 8. The system of claim 7, wherein the multiple processors mine the FP-tree to
2 determine unique information about the items of the data store.

1 9. The system of claim 1, further comprising a multi-core system architecture.

1 10. A system for mining data, the system comprising:
2 a database including a number of transactions;
3 at least one processor to perform mining operations on the database, the at
4 least one processor is to execute content-based partitioning logic on the transactions,
5 wherein the content-based partitioning logic is to partition the transactions according
6 to content based on a number of identified frequent items to obtain a probe structure;
7 and
8 a memory to store the probe structure.

1 11. The system of claim 10, the probe structure further comprising a probe tree
2 and probe table, wherein the probe tree and probe table further comprise 2^M branches,
3 wherein M corresponds to the number of identified frequent items.

1 12. The system of claim 11, wherein the memory further comprises shared
2 memory to store the probe tree and probe table.

1 13. The system of claim 11 further comprising multiple processors to recursively
2 mine the database, wherein each processor shares a substantially equal load based on
3 a grouping and distribution of the 2^M branches.

1 14. The system of claim 13, the multiple processors further comprising a master
2 processor and at least one slave processor to perform mining operations, wherein the
3 master processor distributes operations to the at least one slave processor when
4 building a frequent pattern tree (FP-tree) using the probe structure.

1 15. A method for mining data of a database, comprising:
2 identifying frequent items of the database;
3 building a probe structure based on the identified frequent items, wherein each
4 branch of the probe structure includes a number of identified frequent items based on
5 content;
6 grouping the branches of the probe structure based on the content of each
7 branch; and
8 building a frequent pattern tree (FP-tree) from the probe structure.

1 16. The method of claim 15, further comprising scanning a first portion of the
2 database when identifying frequent items of the database, and scanning a second
3 portion of the database when building the probe structure, wherein the probe structure
4 includes an associated number of counts with each branch of the probe structure after
5 scanning the second portion of the database.

1 17. The method of claim 15, further comprising building the probe structure to
2 include a probe tree and probe table, and using the probe tree and probe table to build
3 the FP-tree for mining the FP-tree to determine frequent data patterns.

1 18. The method of claim 15, further comprising distributing each group of
2 branches to an associated processor before building the FP-tree.

1 19. The method of claim 18, further comprising using a master processor to
2 distribute each group of branches to one or more slave processors, and using the one
3 or more slave processors to build the FP-tree.

1 20. The method of claim 15, further comprising partitioning the database
2 according to content of the identified frequent items to obtain the probe structure,
3 wherein the probe structure includes combinations of the identified frequent items and
4 the number of occurrences of one or more content-based transactions.